

# **Final Report**

**Submitted to:** Jane's Trust

**Date:** March 29, 2013

**Name of Organization:** Green Mountain College

**Program Name (if applicable):** Farm & Food Project

**Grant Amount:** \$100,000

☐ General Operating                      ☒ Project Support  
☐ Challenge Grant                      ☐ Capital/Endowment

**Period that this report covers:** August 2011-January 2013

## **Please describe the project and purposes for which funds from Jane's Trust were used:**

Through our research project, Flash-Freeze Project for Institutional and Charitable Food System Use, funded by the Jane's Trust, we have made several new discoveries about small-scale food processing, freezing of local produce, and distribution in Vermont. We progressed toward our goals despite having encountered several challenges that required us to alter our original implementation plan.

In our project proposal, we outlined three main areas of research:

- Processing gleaned and donated products for donation into the charitable food system.
- Conducting product testing to determine appropriate crops and package sizes for use in institutions, the charitable food system, and within the retail market.
- Determining "price points" for particular products.

We have addressed these areas of research through multiple research projects that involved several farm and food partners:

### **University of Vermont-Extension Partnership**

**Partner(s):** Hans Estrin, UVM Local Food Network Coordinator

**Project(s):** Windham County Farm-to-School, Community High School Processing Pilot

**Grant Goal(s) Met:** Test frozen products for use in schools and prisons

We began our research with a project in Windham County, Vermont, spearheaded by University of Vermont (UVM) Extension's Local Food Network Coordinator Hans Estrin. This endeavor, described in our mid-term report, succeeded in freezing over 2,500 pounds of local produce for use in public school and prison cafeterias. Through this work, Hans and Garland Mason, flash-freeze specialist, worked with three public schools in Southern Vermont to process and freeze 525 pounds of locally sourced food using only student-volunteer labor. This work capitalized on the schools' desire to incorporate more local foods into their cafeteria and the schools' requirement that students complete a set number of community service hours in order to graduate. Through our work with three Windham County public

schools we involved fourteen student volunteers and five adult volunteers. We also learned an important lesson about the utility of the mobile flash-freeze unit.

We initially intended to process and freeze local foods with at least five public schools but quickly discovered that for certain schools, using the flash-freeze unit was not the most practical or efficient option. A few of the local schools did not have the necessary 220-volt power supply, had the wrong type of electrical outlet, or had a kitchen set-up that was not conducive to using the flash-freeze unit. With these schools, we were able to work with their pre-existing infrastructure, rather than with the mobile unit, and in doing so greatly reduced the majority of the logistical challenges we faced. At these schools, we were able to freeze the produce on trays in the schools' walk-in freezers instead of moving processed produce in and out of the flash-freeze unit. They then packaged and stored the produce, as they would have using the flash-freeze unit.

Working with Hans and UVM-Extension, we were also able to partner with the Vermont Department of Corrections to conduct a similar project in two Vermont Community High Schools. Community High Schools in Vermont serve incarcerated youths under 23 who have not yet received a high school diploma or a GED, as well as any inmate over 23 who elects to finish a high school degree or receive supplemental training in a specific field. Training is offered in many different fields, including horticulture and culinary arts. The horticulture program operates large and productive vegetable gardens at two of the schools, one of which also houses a culinary training program where inmates are highly skilled in the culinary arts. These two Community High Schools were natural collaborators on this project.

In the fall of 2011 the mobile flash-freeze unit traveled to the Community High School in Springfield, Vermont and then on to the Community High School in Swanson, Vermont, just south of the Canadian border. At these sites, fifteen inmates processed over 2,000 pounds of prison-grown produce with the support of nine prison staff.

Although the flash-freeze unit was integral to generating interest and enthusiasm for the project, the unit was not essential to the process. Through this project, we learned that the schools and prisons already have the infrastructure in place to continue this project annually on their own, avoiding some of the logistical challenges presented by the mobile freezer. In the future, schools will continue this project independently using their walk-in freezers. At least one Community High School in the state is exploring the option of installing a permanent stationary flash-freezer on site in order to scale up light processing and freezing.

#### **Sunrise Orchards/Vermont Refrigerated Storage Partnership**

**Partner(s):** David Dolginow, Sales, Development & Technology Staff at Sunrise Orchard

**Project(s):** Neighboring Food Co-ops Association Farm-to-Freezer Program

**Grant goal(s) met:** Test product and package sizes for flash frozen products for use in regional food co-ops; determine price points for particular crops

Through this partnership, the mobile flash-freeze unit was used to freeze 2,000 pounds of blueberries for the Neighboring Food Co-ops Association Farm-to-Freezer Program. The use of the flash-freeze unit represents a segment of a larger research project conducted by Sunrise Orchards & Vermont Refrigerated Storage in partnership with the Neighboring Food Co-ops Association.

The scale and efficiency of the mobile unit was put to the test while working on this project. The unit was run for 37 hours within two days, and it was found that the unit was not an efficient means of freezing this volume in such a short amount of time. The mobile unit also lacks packaging equipment and Sunrise Orchards found it necessary to bring their frozen product in bulk to Rhino Foods forty miles away in Burlington, Vermont to be packaged.

Sunrise Orchards continued their Farm-to-Freezer program during the 2012 growing season and used Farm-to-Table Co-Packers based in Kingston, New York, to process and freeze their blueberries. Farm-to-Table has a liquid nitrogen-based individual quick freeze tunnel. The co-packer also has a completely automated filling and packing line. Because of these major pieces of infrastructure, Farm-to-Table Co-Packer is better suited to meet the needs of Sunrise Orchards' project.

Sunrise Orchards has extensively tested the retail market within regional food co-ops and has shared their findings with us. They have also tested the institutional food market by establishing relationships with institutions such as Fletcher Allen Hospital and Sodexo Dining Services which serves the University of Vermont. Key findings including a detailed financial summary and price points are described on pages 25-28 of Green Mountain College MBA student, Jessica DeMatteo's capstone project, which is described below under the heading *Freezing Local Produce for Sale to Institutions* and can be found in its entirety in appendix B of this report.

### **Freezing Local Produce for Sale to Institutions**

**Partner(s):** *Jessica DeMatteo, Green Mountain College MBA Student*

**Project(s):** *Feasibility Analysis in New England*

**Grant goal(s) met:** *Determine price points for particular products for sale to institutions*

Green Mountain College MBA student Jessica DeMatteo collaborated on our research to complete her capstone project. Jessica identified the need of farmers in Vermont to maximize their saleable harvest in the short growing season. She also recognized that an increasing number of institutions interested in serving local food had a need to procure and serve produce from farmers beyond the summer and early fall harvest. Jessica then completed a feasibility study that investigates whether freezing local produce is an economically viable solution to addressing the needs of both farmers and institutions in terms of local purchasing. Through her research Jessica was able to identify the primary barriers and enablers to success.

The primary barrier Jessica found that impedes the success of the frozen local food industry is cost. She notes that "the price institutions were willing to pay, the actual costs associated with processing, or the price at which local farmers were willing to sell their produce, all ranked at the top of perceived barriers to success" (p 52). She identified the key indicators for success of the industry as demand for the product and the existence of a strong "local food culture" (p 52). Jessica also created lists of areas of further research and potential strategies which can be found on pages 53 and 54 of her report.

Jessica's thesis represents the most comprehensive information available on this topic in New England. A complete copy of Jessica's capstone is included in the appendix of this grant report.

### **Mobile Flash-Freeze Unit Use on Farms**

**Partner(s):** *Kilpatrick Family Farm, Maple Wind Farm, Amee Farm*

**Project(s):** *Freezing for CSA and retail markets*

**Grant goal(s) met:** *Test demand for flash frozen products in farmers markets and CSA*

In proposing the original grant we anticipated that travelling with the unit and using it on farms would be a major component of our research. Our experience proved that the flash-freezer, as a mobile unit, is generally not well suited for use on farms due to logistical challenges. Farmers are generally reluctant to use the unit due to the presumed risk of limited marketing opportunities, storage concerns, and a booming, unsaturated market for fresh produce. Ultimately, it proved difficult to recruit and incentivize farmers to use the freezer unit either on-farm or as a stationary unit parked adjacent to the College's Community Commercial Kitchen.

The farmers that were able to take advantage of the unit either on their farm or on site at Green Mountain College had mixed reviews. All expressed some degree of surprise at how long their produce took to freeze and most expressed some concern over the lack of flexibility the unit offers in terms of product flow. The farmers were generally happy with the quality of the finished product and were able to distribute it throughout the winter to their shareholders in Community Supported Agriculture (CSA).

During the 2012 season we did not actively recruit farmers to trial the unit and instead turned our focus to farm-to-institution projects with fewer barriers to success.

### **Assessing Cold Storage Options and Strategies within the Region**

**Partners(s):** *Ruth Hazzard, University of Massachusetts-Extension; Vern Grubinger, University of Vermont-Extension*

**Project(s):** *Assessing cold storage options and strategies within the region*

In March of 2012 Garland Mason undertook a research study on existing cold storage infrastructure throughout the region. Through this study Garland visited eleven farms, one food processor, and one co-operatively managed aggregation and distribution site. Garland compiled her findings in a comprehensive report entitled *Cold Storage Options for Small-Scale Diversified Farms in the Northeast*. The report examines the types of infrastructure that are in place for long-term crop storage and their effectiveness. Although the report does not focus entirely on frozen vegetables, a farmer's ability to efficiently and effectively store and market produce through the winter greatly affects the need and incentive for farmers to freeze produce in order to provide marketable products year-round.

This research has spurred increased interest in learning more about the cold storage options available to farmers. UVM-Extension will continue to build on this segment of our research.

### **Freezing College-Grown Produce for the Dining Hall**

**Partner(s):** *Green Mountain College's Cerridwen Farm, Chartwells Dining Services*

**Project(s):** *Freezing College-grown produce for use in the College Dining Hall*

**Grant goal(s) met:** *Test products and package sizes for use in the College dining hall;  
Determine price points for particular products for sale to institutions*

Green Mountain College's Cerridwen Farm has benefitted from the proximity of the mobile flash-freeze unit to the farm's operations since the unit arrived on site in July of 2010. Use of the freezer unit has greatly expanded the College's ability to make produce grown on the campus farm available in the

dining hall. In 2011 the College froze 1,946 pounds of tomatoes for use in the dining hall at a total value of \$1,779.40.

In 2012 the farm's sales of processed products to the dining hall doubled to \$3,631.63 with 3,053 pounds of College-grown produce processed. Value-added frozen products sold to the dining hall in 2012 were comprised of cored tomatoes, kale, mustard greens, chard, salsa and pesto. Over twenty students helped process the crops. This provided a valuable applied learning component for summer coursework.

Kenneth Mulder, Cerridwen Farm Manager, noted that identifying appropriate crops with the intention of freezing rather than marketing fresh proved more cost-effective than freezing a surplus of high value crops. To illustrate this he used the example of tomatoes: "high tunnel tomatoes sell fresh wholesale for \$2 per pound. The field tomatoes [sell] for \$1 a pound. They have the same value of \$0.70 per pound frozen and the field tomatoes tasted better."

Kenneth also found that "greens, when harvested in large quantity and efficiently processed were very worthwhile." He noted that at Cerridwen Farm, these greens (kale, mustard greens and chard) are easy to grow and often produce a bumper crop at certain times of year. These factors made them natural candidates for processing.

The farm found that salsa generated the highest net profit overall, netting \$1.75 per pound for vegetables that normally would have sold for \$0.70 to \$1.00 per pound. They also found the pesto and greens to be "high-impact," meaning that in the dining hall "a little went a long ways."

Through use of the flash-freeze unit, the College has been able to greatly expand the amount of food from the College farm that is served in the dining hall. A forthcoming plan of action will allow the College farm to continue to increase sales of lightly processed frozen foods to the dining hall following the return of the flash-freeze unit to the Vermont Agency of Agriculture.

### **Center of the Plate Initiative**

**Partner(s):** *Chartwells Dining Services*

**Project(s):** *Incorporating more local food into the dining hall and boosting student involvement*

**Grant goal(s) met:** *Test products for use in the College dining hall*

As outlined in the goals of the Sustainable Purchasing Initiative adopted by the College in 2006, increasing the amount of local food served in the College dining hall is a priority. In October of 2012, Chartwells launched the "Center of the Plate" Initiative. This program will slowly change the type of food available in the College dining hall and will incorporate more local and responsibly sourced foods with the goal of incorporating at least 30% local and sustainable ingredients into the menu. This will occur, in part, by serving less meat, sourcing more produce from local farms and by incorporating volunteer student labor to reduce the cost of lightly processed local foods. In the fall of 2012 a group of committed students proposed a new club called the "Center of the Plate Club" to help process and freeze local produce for the dining hall. Students helped source, process and freeze 800 pounds of zucchini and summer squash, 300 pounds of broccoli, and 250 pounds of cauliflower in partnership with two local farms. Over twenty-students were engaged in this project. Through this activity we found that squash was not versatile enough as a coined product but did prove useful in shredded form. The cauliflower and broccoli did prove to be popular menu items.

Next year, without the use of the flash-freeze unit, students will use walk-in coolers and freezers and will explore processing for dehydration and for use as fresh processed product. The students will continue to process broccoli and cauliflower and will create new products from a variety of other crops for the dining hall to trial in its menu.

### **Grow-a-Row and the Development of the Vermont Commodities Program**

**Partner:** *Rutland Area Farm & Food Link; Salvation Farms*

**Project(s):** *Processing and freezing gleaned and donated produce, creating and testing a line of lightly processed frozen products for the charitable food system*

**Grant goal(s) met:** *Process gleaned produce for the charitable food system; Test products and package sizes for use in the charitable food system*

During the 2012 growing season, the focus of our research shifted to the role of the flash-freeze unit within the charitable food system. To coordinate our research efforts we partnered with two non-profit organizations, the Rutland Area Farm and Food Link (RAFFL) and Salvation Farms. RAFFL was an obvious partner, having had a long and fruitful relationship with the College and having been an original collaborator in the proposal to lease the Vermont Flash-Freeze Unit. RAFFL's food access and gleaning program Grow-a-Row could provide all of the produce we would need to meet the grant goals of processing gleaned produce and testing products and package sizing for the charitable food system.

Salvation Farms, a new regional non-profit based in Morrisville, Vermont, was contracted as a partner in this project and provided both the expertise in maximizing the food access and gleaning program, as well as the broader statewide vision for the future of this endeavor.

Through these partnerships, we were able to glean and collect over 14,000 pounds of produce from over twenty local farms during the 2012 growing season (June through October). Of this, about 13,000 pounds were donated fresh to thirteen different charitable food sites while the remaining 1,000 pounds of produce were used to create a line of frozen local products. Six charitable food sites, consisting of four meal sites and two food shelves, tested each product and provided feedback on each. Recipients commented on everything from package sizing and versatility to palatability and aesthetics of the product. This information, as well as a detailed data set that ascribes price points to each product will be used by Salvation Farms to steer the Vermont Commodities Project.

In the future, the capture of surplus produce will be managed by a statewide gleaning collective under the direction of Salvation Farms. The collective will forge partnerships between established gleaning initiatives, including RAFFL's Grow-a-Row program, and in doing so will help to streamline the collection and distribution of surplus local produce in Vermont. Progress is currently being made to develop a labor sourcing relationship with the Department of Corrections' Offender Work Program with infrastructure provided by Vermont state prisons. The 2012 pilot in cooperation with Green Mountain College and the Rutland Area Farm and Food Link will provide the knowledge and background needed to move the Vermont Commodity Program forward.



- **An accounting of the extent to which the grant from Jane's Trust provided leverage to attract other funders.**

The Jane's Trust grant helped Green Mountain College's Farm and Food Program to leverage funds for related projects from four additional grantmakers. Our research has also helped to leverage funds for a follow-up research project led by University of Vermont-Extension.

- Windham Foundation, \$10,000
  - We received an additional \$10,000 to stock our Community Commercial Kitchen with the cookware and appliances necessary to meet the goals outlined in the grant proposal to Jane's Trust. The funding also served our institutional goal of creating a fully equipped commercial kitchen available for use by the community. Our kitchen is now a fully functional commercial space offered for use to community members and aspiring entrepreneurs.
- Duke Energy Foundation, \$25,000
  - The Jane's Trust funding for food and agriculture-related research provided leverage for funding for the Solar Harvest Center Garden-to-Table Project. This project includes the community in reviving the art of growing and preparing one's own food, sharing it with family and friends and discussing garden-to-table practices in a learning environment.
- Pierson Family Foundation, \$10,000
  - Matching funds for the Solar Harvest Center Garden-to-Table Project
- Northeast Sustainable Agriculture Research and Education Program (NE-SARE), \$15,000
  - University of Vermont Extension procured a grant from NE-SARE to fund research on cold-storage for diversified farmers and the development and implementation of a curriculum to educate farmers about cold-storage technology. This project builds on the cold-storage research completed through our Jane's Trust funding.

**Please evaluate the results achieved with funds from Jane's Trust and include:**

- **A report on progress towards expected outcomes as outlined in the original proposal;**

Two intended outcomes were identified in the grant proposal. The first was the delivery of high nutritional value, flash-frozen food to more than 9,500 individuals in Southern Vermont. Through our projects we have created approximately 12,000 pounds of high quality frozen product. This product has subsequently been made available to: the student body of three public schools in Windham County; the inmate population of two Department of Corrections Community High Schools; the retail customers of thirty different food co-ops throughout New England; the CSA members of three different farms; the entire student body of Green Mountain College; and the patrons of two food shelves and three charitable meal sites in Rutland County. Although it is difficult to measure the exact number of individuals to whom our frozen products were made available, we can be sure that product was made available to several thousand consumers.

In pursuing our first intended outcome, we made significant progress in achieving our second outcome: an assessment of the best logistical and economic methods for using flash-freezing in Vermont in order to extend the availability of healthy, local produce to a variety of markets and populations, with a keen focus on penetrating institutional markets and the charitable food systems. Through our research we have made a thorough assessment of flash-freezing and its potential role in the institutional and charitable food systems. Our research has informed the future of flash-freezing for institutional markets in Vermont and may have invigorated the market itself. It is evident that our endeavors, coupled with an increasing awareness of local food culture, has helped to increase the demand for local produce year round. Our work within the charitable food system has set the stage for the future of the Vermont

Commodities Program spearheaded by Salvation Farms. This program will build on our work by continuing to provide flash-frozen local produce to the charitable food system.

- **An explanation of major developments during the term of the grant, including unexpected difficulties or opportunities;**

We encountered significantly less farmer interest in the flash-freeze unit than we had anticipated. This lack of interest can be attributed to a number of barriers previously described under the heading *Mobile Flash-Freeze Unit Use on Farms*. After discovering the lack of interest and significant barriers, we focused our attention on utilizing the unit in cooperation with institutions and as a stationary unit on the Green Mountain College campus. Through this unexpected challenge we have discovered an opportunity—the unit’s true utility lies in its function as a temporary-stationary unit. The unit may be used for two or three consecutive growing seasons to jumpstart a pilot project’ but it is not suitable for established or larger-scale endeavors. We have had great success using the flash-freeze unit as a stationary unit on campus to support the Salvation Farms pilot project as well as our own farm-to-campus dining hall programs. After having used the unit with success we are now able to make an informed decision regarding our future plans as both endeavors have outgrown the mobile-unit.

Salvation Farms plans to scale up the Vermont Commodities Project in partnership with the Vermont Department of Corrections. In scaling up, infrastructure improvements will be informed by the perspectives gained from using the mobile unit with its complex advantages and challenges. For Green Mountain College and Cerridwen Farm, processing local produce for the campus dining hall would not have become such a major component of our farm-to-campus initiatives without the spark that the mobile unit provided. With the momentum provided by the flash-freeze unit, the College will continue to process and freeze produce for the dining hall and plans to make infrastructure improvements that will facilitate these activities.

By using the unit as a temporary-stationary flash-freezer, we have found that the unit is effective at providing the initial infrastructure needed to pilot a project. It is also a learning tool to find what types of infrastructure are needed to continue with and expand the initial project.

- **A description of the impact of the grant on your organization and its goals;**

This grant and its associated projects have contributed greatly to the culture of collaboration between a number of local and regional organizations working in small-scale food processing. The research funded by Jane’s Trust has helped Green Mountain College forge partnerships and connections between the Rutland Area Farm and Food Link, UVM Extension, the Vermont Department of Corrections, Salvation Farms, Sunrise Orchards/Vermont Refrigerated Storage, the Vermont Food Bank, the Vermont Agency of Agriculture, and the thirty-plus local farmers who have provided produce for one of our many grant-related projects or who have utilized the unit itself.

Through this grant, the Green Mountain College Farm and Food Project has been able to prove itself as a resource to our local agricultural community. The grant has enabled the Farm and Food Project to strengthen the existing partnership with the Rutland Area Farm and Food Link and in doing so has secured a place as another agriculture service provider to our community. Green Mountain College has

also made progress towards the goal of contributing to a sustainable regional food system through this project.

- **A description of any revisions to your original program, agenda, timeline, staffing or budget;**

As explained in the letter sent to Jane's Trust in June 2012, we made revisions to our original implementation plan and budget based on our findings during the 2011 growing season. These budget changes allowed us to provide more staffing to the project during the 2012 season. As described in the letter, we originally allotted \$15,000 to cover transportation and transportation-related expenses for the two growing seasons. However, we transported the unit to fewer sites than anticipated and did more of the processing in centralized commercial kitchens than we expected. We then used the remaining funds to provide compensation to our key partner, Salvation Farms, who provided the expertise and long-term vision needed to develop the pilot for the Vermont Commodities Program, our major project for the 2012 season. We were also able to hire an assistant who coordinated the procurement of produce for the project and also provided labor in processing the produce to create the end-products. The success of this partnership is outlined in more detail under the heading *Grow-a-Row and the Development of the Vermont Commodities Program*.

- **A description of any special insights gained during this process that would be useful to the Trust or to others;**

We have gained many insights into the feasibility of small-scale light-processing of locally grown produce and have much to share with others. Areas of interest for other farmers, small-scale processors and potential purveyors of these products (including retailers, institutions and charitable food sites) include food safety, findings pertaining to particular crops including methods, packaging and viability of products, and costs of production. We have also gained many insights into the logistics of the mobile freezer unit and flash-freezing technologies.

Our research resulted in a better understanding of commercial kitchen operations, management, food processing and handling procedures that have changed the way our kitchen operates. The processing project we completed in collaboration with Salvation Farms, whose end product is served to the most vulnerable populations, heightened our awareness of food safety standards. This research prompted the creation of a strict set of policies and procedures which guide kitchen use and promote food safety. To further our understanding of food safety we collaborated with and received valuable feedback from Londa Nwadike, UVM-Extension's Food Safety Specialist. Prompted by our interest, Londa taught a two-day food safety course at Green Mountain College, offered to students and the community at large. The newly developed policies and procedures for kitchen use can be found in Appendix F of this document. These policies and procedures have proven to be effective in streamlining kitchen use and clean up to help ensure food safe production standards. Following the end of this grant period a part-time kitchen manager will be hired to maintain the policies put in place through this grant. The procedures and protocols developed for our community commercial kitchen are available on the web and may be used as a model for others operating similar facilities. We have shared knowledge of food safety through a course offered by Londa Nwadike, UVM Extension's Food Safety Specialist. Food safe practices are also emphasized in the short film we created which is described below and can be found in appendix A.

By trialing a great diversity of crops, we have collected hard data regarding labor and inputs for specific crops and processing methods. Certain crops and the products we have created from them are not often processed on a small scale. Products such as frozen corn kernels and frozen green beans are generally processed at a very large scale using highly-specialized machinery. We have compiled a report that evaluates the cost-effectiveness and efficiency of processing each crop and product based on data we collected during processing. The report details the process used to preserve each trial crop as well as the cost associated with the raw product, labor and energy inputs and supplies (gloves, packaging, etc). Each crop is accompanied by two price points—one that includes labor costs and one that does not. These details will prove to be extremely helpful to individuals hoping to replicate our work in other regions. We also have synthesized qualitative data from feedback received from sites whose clients taste-tested the products. A report that summarizes our findings about each crop is included in appendix C of this report. The report is also available on Green Mountain College's website.

Product price points were established for the product line we created in partnership with Salvation Farms. Because the products created are distributed free of charge these price points assign a theoretical value to the products. By analyzing data gathered during processing, and evaluating crop values assigned by market value, as well as the cost of inputs (bags, labels, transportation, and cooking fuel) we were able to identify the true cost for each product. This information will help Salvation Farms choose which crops to continue to pursue and which crops to either process differently, or not process at all within the Vermont Commodities Project. Crop-specific price points are included in the crop report in appendix C of this report.

Sunrise Orchards has also collected specific retail price point information for each crop. Although some of this information is proprietary, Sunrise Orchards has shared that their products are valued at 150% of the cost of their conventional counterparts (e.g. Birdseye brand), yet evidence supports that a significant and growing market for both organic and conventional frozen-local products exists. More information regarding Sunrise Orchard's price points are included in Jessica DeMatteo's capstone project which can be found in appendix B.

Through using the mobile flash-freeze unit for two full growing seasons, we have come to understand the intricacies and challenges of its logistics. By utilizing the unit in various settings and for a great diversity of products we have come to realize that the unit itself presents a number of challenges in its design alone:

- The unit is not ideal for highway travel due to the heavy compressor being placed atop the trailer. Ideally the compressor, the trailer's single heaviest component would be placed lower, perhaps near the trailer hitch to allow for easier, safer and more efficient hauling.
- The unit is not adequately insulated as demonstrated by the excessive condensation that accumulates on the outside of the freezer section of the unit when in-use. With adequate insulation, the unit would prove more effective by dropping to and subsequently maintaining a lower and more consistent temperature regardless of outside conditions.
- A poorly placed wall inside the unit also presents a physical challenge as there is neither an easy nor effective way to move racks of produce from outside the unit to inside the unit and vice versa. This impedes the flow of product through stages of processing, freezing and packaging.
- The unit's roller conveyor, intended for bringing produce into the unit, is also problematic. Because the unit sits on wheels about sixteen inches from the ground, when extended, the belt reaches a height of about four-feet outside the unit. The conveyor has proven too inconvenient and uncomfortable to use when loading any significant amount of produce.

- The fan inside the unit is also poorly placed at the end of the conveyor. The fan could prove useful but its placement would mean that the trays would need to be loaded incredibly slowly into the unit and would require at least one person at each end of the belt loading the trays and subsequently loading them onto racks.

We ultimately found that the unit was a good starting point for our pilot projects but would prove to be extremely inefficient when used at capacity. During the grant period, about twenty individuals have called seeking advice in building a similar model. We have relayed our findings to each inquirer and have helped them lay out a superior unit.

One important lesson we have learned is that it may be equally efficient to use a walk-in freezer that has been set to at least negative 15 degrees Fahrenheit. When attempting to process and freeze any significant volume of a single crop for retail, it may be more effective to bring said product to a co-packing facility that has the appropriate infrastructure and knowledge to create a high quality product with maximum efficiency.

Based on the insights we have gained through our research we are well-positioned to advise the Vermont Agency of Agriculture on appropriate uses for the mobile flash-freeze unit after our lease has ended. We have recommended that the Agency of Agriculture release a call for proposals for creative business plans from farmers interested in exploring small-scale food processing for the retail market. This would allow a single mid-scale farmer, or a handful of small farms in close collaboration, to effectively test the retail market for lightly-processed frozen products.

Through our research, we found that many farmers have been reluctant to use the mobile flash-freeze unit on the Green Mountain College campus for a number of reasons. The primary reason has been concern regarding the longevity of the unit at our site. Small-farmers are reluctant to invest their already scarce time, energy and resources to test the unproven retail market for lightly processed products without the assurance that they would be able to test the market over multiple growing seasons using the flash-freeze unit. The market for fresh produce in Rutland County is not yet satiated and as long as farmers are producing for an unsaturated market there is little incentive for them to produce for an untested and therefore risky market.

By leasing the mobile unit to a single farm (or a group of farms) as a stationary unit, farmers can be sure they will have the unit where they need it, when they need it. They may then be more motivated to grow produce specifically for processing and will be able to adequately test the retail market. After a period of three growing seasons, a farmer may then make the decision regarding whether they want to invest in permanent infrastructure to continue processing, or whether this is a market they are not interested in pursuing.

In our original proposal we suggested that this could become a self-sustaining business model, bringing in enough revenue through rental of the unit and Green Mountain College's Community Commercial Kitchen to pay for part of the salary of the specialist position and collaboration with RAFFL. Through our research we have found that this is not the best use for the flash-freeze unit and that the unit would be best suited to support pilot and start-up projects. We have found that permanent infrastructure custom designed to improve synergy with our existing infrastructure will be the most effective way to expand upon our farm-to-dining hall work. Green Mountain College is also completing research that will lead to the design of an energy-efficient cold storage facility featuring four temperature gradients; cold and wet (root storage), cool and moist (potato storage), warm and dry (squash storage), and cool and dry (onion

and garlic storage). This facility will serve Green Mountain College's Cerridwen Farm as well as the broader community, including the charitable food system. Finally, Green Mountain College is pursuing collaborations for increasing midscale agricultural production in the region, thereby serving our alums, institutions, and the charitable food system.

- **A description of your efforts to communicate the results of the grant and any insights you gained to other organizations or individuals**

The mobile flash-freeze unit was exhibited at the Vermont Fresh Network Annual Gathering in 2011 and again at the National Farm to Cafeteria Conference in Burlington, Vermont, in 2012. At both events flash-freeze specialist Garland Mason accompanied the unit. Garland was able to answer questions and give tours of the unit to about twenty interested parties at each event.

Our research and findings were presented at two national conferences. Garland presented information on the mobile flash-freeze unit at the National Farm to Cafeteria Conference in Burlington, Vermont, in August of 2012. In September of 2012, Garland presented on the applied-learning projects that have utilized the unit at the Sustainable Agriculture Education Association Conference in Corvallis, Oregon. Garland also traveled to Oakland, California in the fall of 2011 to represent our project at the Community Food Security Coalition National Conference.

The research was also presented at two regional conferences and one workshop. Hans Estrin presented on the farm-to-school and farm-to-prison projects completed through the partnership with UVM Extension at both the Vermont School Nutrition Association Annual Conference in the fall of 2011 and the Northeast Organic Farming Association of Vermont Annual Conference in the winter of 2012. Garland Mason, Hans Estrin and David Dolginow each gave a presentation on different aspects of the flash-freeze project at the Cheshire County Conservation District Crop Storage and Post-Harvest Handling Workshop in Troy, New Hampshire, during the fall of 2011.

Over the span of the grant, we have answered questions and shared our insights with over thirty individuals and organizations that have inquired about the flash-freeze unit and our research. These inquiries have generally consisted of 30-60 minute phone conversations and follow-up emails. As a result of one of these inquiries, our work and findings have been highlighted in the Institute for Agriculture and Trade Policy's report *Frozen Local: Strategies for Freezing Locally Grown Produce for the K-12 Marketplace* published in December, 2012. Relevant sections of the report are included in Appendix H.

To share our knowledge, we have also partnered with Almost Blue Productions, a local filmmaking company, to create a short documentary film on our work for the charitable food system. The documentary includes a synopsis of the history of the unit, our gleaning and food rescue work, and focuses on small-scale food processing and what we have learned through our use of the flash-freeze unit. The goal of the documentary is to tell our story and to provide a resource to other organizations that are interested in pursuing similar projects throughout the country.

By publishing our reports on the Green Mountain College Farm & Food Project website, we have shared reports of our findings and other resources. We have made all materials found in the appendices of this grant report available on the website.

Philip Ackerman-Leist has highlighted our work in a number of presentations he has given, including:

- As a guest lecturer at colleges and universities during winter/spring 2013, including Williams College, Appalachian State University, Clemson University, UNC-Chapel Hill, Antioch University, Middlebury College, Paul Smith's College, Colby-Sawyer College, Luther College (IA), and Arizona State College.
- As a guest lecturer at York College (October 2012): "Local Eyes: Visioning the Not-So-Distant Future of Food" in York, PA
- As a presenter at Mother Earth News Fair in Seven Springs, PA (September 2012): "Retooling for Tomorrow: Tools and Technologies for the Modern Homestead"
- As a panelist for the National Farm to Cafeteria Conference in Burlington, VT (August 2012): "Growing Up Local: Vermont Farm to Institution Pioneers Share Their Stories"
- As speaker of the week for the All Star II Family Conference at Star Island, NH (July 2012): Five presentations based on the theme of "Transitions: Building Resilience in Changing Times"
- As a panelist for Slow Living Summit in Brattleboro, VT (June 2012): "Sustainability in Higher Education," with an overview of the GMC Farm & Food Project
- As a panelist for Vermont Food Bank Annual Conference on local food initiatives in Vermont in Burlington, VT (May 2012): Overview of GMC's Sustainable Food Purchasing Initiative
- As a keynote speaker for AERO Annual Meeting at Glacier Lake, MT (October 2011): "Sustainability Begins at Home"
- As a presenter at "Seeding the Future" Conference at Dickinson College in Carlisle, PA (October 2011): "The Liberal Arts & the Practical Arts: Cross-Pollination on the College Farm"
- As a presenter for Mother Earth News Fair (September 2011): "Local Food: Redrawing the Lines"
- As a keynote speaker for SolWest renewable energy & sustainable living fair in John Day, OR (August 2011): "Modern Homesteading: Positively Practical?"
- As a presenter at Solarfest in Tinmouth, VT (July 2011): "Season Extension for the Farm & Homestead" (co-presented with architect Lucas Brown)

Philip Ackerman-Leist will also include this research and its findings in presentations to other organizations (including colleges and universities) across the United States during his 2013-14 book tour to promote *Rebuilding the Foodshed: How to Create Local, Sustainable, and Secure Food Systems*, a new book released in 2013 that prominently features this flash-freezing research project alongside other innovations in community-based food system efforts throughout the country (<http://www.amazon.com/Rebuilding-Foodshed-Sustainable-Community-Resilience/dp/1603584234> ).

## **Appendix Items:**

**A:** Abstract and link to dissemination video

**B:** Jessica DeMatteo's feasibility study:  
"A Market Analysis to Extend the Life of the Local Growing Season in Vermont"  
(*Included*)

**C:** Crop Cold Storage Study (*Included*)

**D:** Windham Grant Report (*Included*)

**E:** Kitchen Policies and Procedures (*Included*)

**F:** Salvation Farms Relevant Blog Posts (*Included*)

**G:** Salvation Farms Vermont Commodities Report (*Provided as separate document in PDF format*)

## **Appendix Item A:**

The video, “Glean, Freeze, Give” is a mini-documentary (12:40 in length) of the Jane’s Trust flash-freezing research project and its link to the charitable food system. The video was produced by GMC alumnus Benjamin Stimson of Almost Blue Productions and features key players in the project, ranging from participating farmers to VT Secretary of Agriculture Chuck Ross. The background music was written, produced, and graciously provided by GMC faculty member Dr. Sarah Mittlefehldt and her husband John Gillette. This video is available in multiple locations online for dissemination purposes, and GMC and other associates are showing it at conferences and other educational venues.

“Glean, Freeze, Give” can be accessed at <http://www.almostblueproductions.com/> and will soon be on the redesigned website for the GMC Farm & Food Project.

# **Appendix Item B:**

Capstone Proposal:

A Market Analysis to Extend the Life of the Local Growing Season in Vermont

Jessica DeMatteo Green

Mountain College

BUS6090

Faculty Advisor – Matt Mayberry

September 15, 2011

## **Introduction**

New England farmers face the dilemma each year of how to maximize their saleable harvest. A short growing season results in a small window of opportunity to produce and sell their produce. Concurrently, institutions who are interested in eating locally and supporting their local economy are looking for ways to eat produce from farmers in their community beyond the summer and early fall harvest. In a world where grocers' produce bins are stocked with everything from tomatoes to apples to summer squash 365 days of the year, consumers have

often unconsciously created a demand for foods grown in other states and countries, especially once their local farmer's market closes for the season. However, many consumers are beginning to demand a change as communities of localvores begin to sprout up around Vermont and New England. In an article focused on bringing local foods to institutions Rathke states, "demand has been rising in the last few years, not just from schools but from institutions such as colleges and hospitals as people seek fresh, healthy, safe foods, while supporting local farmers and reducing environmental impacts of transporting foods long distances" (Rathke, 2011). There is interest that exists in more sustainable ways to eat, and that interest is growing.

This study investigates whether flash freezing local produce can provide an economically viable solution to this dilemma. This project will focus on developing a market analysis for a future business plan offering Vermont farmers the ability to flash-freeze crops to support local consumer demand. Building off the research conducted by the Green Mountain College Farm & Food Project and the Rutland Area Farm & Food link, further analysis will assess and define the market, identify the target customers on both the supply (farmers) and demand (institutional customers) side of the offering. In addition, the study will determine viable price points for different market segments and with that information, determine how many customers are needed to create a viable business.

## **Problem Statement**

Making a living as a farmer in Vermont is challenging. As suppliers of locally grown produce, margins are generally low and environmental factors can make or break a growing season. In addition, farmers are dealing with a highly perishable product. If they are not able to sell their harvest fresh, composting the overflow is often their only option. Supporting their customers in the way they demand can also be challenging. For

institutions, meal planning is an important part of providing food service to their customers. It is difficult for farmers to inform the institutions exactly what type and amount of foods will be available in a given week. With these unpredictable conditions, farmers would benefit from finding ways to preserve their harvest for future use. This analysis will be the foundation for a business plan, which will provide a solution to help farmers maximize sales from their harvest.

Consumers of local produce do not have it much easier. Vermont consumers lack access to local produce in fall and throughout winter. This means consuming produce grown many miles away, which affects taste, lowers nutritional content, and increases environmental impact. For a growing number of consumers this is unacceptable. In addition, for institutions wanting to utilize more local foods, their inability to predict the type and quantity of produce available each week makes it very difficult to plan meals effectively. The logistics of getting local foods to institutions in a timely manner can also be an obstacle. As a result, incorporating fresh local foods into their menus becomes a challenge. However, despite these obstacles, demand for local produce is on the rise. Therefore, it has become essential that farmers have an option to preserve a portion of their harvest for future consumption.

### **Purpose Statement**

The purpose of this analysis is to develop a market analysis intended to be the basis for a business plan that allows local Vermont farmers access to mobile flash-freezing technology, bringing local produce to institutions in an extended season. The analysis will consider the available market, who the ideal target customers are, whether there are enough of them in a defined geographical region, and what price customers will accept for the product offered. This information will provide the foundation for a business plan to be developed at some future date and will be the leading indicator as to the feasibility of such a plan. The resulting market analysis will provide the basis for an environmentally friendly solution to maximize the usage of local harvests and extend the sale of local produce to meet institutional demand into the late fall and winter seasons.

### **Research Questions/Hypothesis**

Can there be a viable, self-sustaining, value-add business which provides flash-freezing services to local farmers in Vermont, supporting their goal to extend the growing season and meet institutions' demand for local produce? My hypothesis is that the development of such a

business model is indeed feasible and will provide value to the supplier, consumer and local food economy, and this market analysis intends to prove out such a hypothesis.

### **Core Literature**

I will be investigating several primary topics through a literary review of available research. One critical subject of research will be flash-freezing technology and its application for the small local farm. Sources for such information will include local media articles covering the work done in conjunction with the Green Mountain College Food & Farm Project as well as articles written in other parts of the country where this technology is under exploration, including Missouri and North Dakota. In addition, I will seek out general information on local food and sustainable communities. Sources for such information may include the American Journal of Alternative Agriculture, the Journal of Rural Studies, and the American Journal of Agricultural Economics.

An additional topic to be researched is the demand for local produce in institutions and the impact of pricing on this demand. This research will be conducted through general media sources reporting on local food systems as well as periodicals including local food magazines like Edible Rhody and Vermont's Local Banquet magazine.

A review will be conducted of the websites and publications of several New England local food movement organizations such as Farm Fresh Rhode Island, Rutland Area Farm & Food Link, and the Intervale Center. The intention of such research will be to understand further the needs and challenges of both local farmers and consumers who are striving to incorporate more local foods into their diets.

Finally, demographic and population data will be gathered to help in the determination of the number of farmers and institutions constituting the target market for this business. Sources of this data include the national census data, as well as other federal, state and local publications. The Vermont Department of Agriculture is another valuable source for farmer demographic information.

### **Research Activities/Methods:**

Some of the more detailed questions that this market analysis will attempt to address include the following:

- What are the barriers to success of developing a business to provide flash-freezing services to farmers, and how can they be removed?
- What are some of the enablers to support such a business, and how can they be best leveraged?
- What is the appropriate pricing for local frozen produce to myriad institutions including public schools, private school, colleges and universities, hospitals and senior centers?
- Is the assumed lower price point demanded by institutions such as public schools a realistic goal for this business model?
- What is the importance of the business being run in a sustainable manner, to all stakeholders including farmers, the labor force, customers, the community and the environment?
- Is a mobile unit desirable, or would a stationary unit be a more viable solution according to market feedback?
- What promotion techniques would be most effective to generate demand from both suppliers and end customers?

This project will utilize several research methods in search of answers to these questions and in development of the resulting business plan. In addition to reviewing existing literature, I will be conducting research to gather additional relevant data. Live interviews with New England farmers and other organizations supporting the local food movement will be conducted.

The primary purpose of these interviews will be to clarify the needs of farmers and determine the perceived benefit of access to a flash freezing service for their produce surplus. I will attempt to glean insights into the barriers and enablers for farmers in utilizing such a service. Finally, I hope to gather information on a fair market value for the produce they would intend to sell through this new channel.

Interviews and surveys of potential customers would be another methodology utilized in this research. Talking with employees of institutions who make decisions on food procurement and set policies concerning food sourcing would provide valuable insight into the level of demand for such a product. In addition, these interviews would aim at determining an acceptable price point for frozen local produce. Another group I will interview is third party companies contracted to supply food to

institutions. Speaking with these individuals will help to clarify the desired route to market for local frozen foods. Finally, analysis of pricing data as it relates to frozen produce and the identification of a premium placed on local foods will aid in determining the optimum price point for a local frozen produce product.

### **Operational Definitions**

Localvore: a person dedicated to eating food grown and produced locally

Viable business: In the context of this study, a viable business exhibits, at a minimum, the following characteristics.

- Exhibits strong potential for a payback on the initial investment within five years
- The business has long-term potential, bringing value to the local economy for years to come
- The environmental impacts of operations are minimal. A good benchmark would be that the carbon footprint of each unit produced would be less than that of a unit of frozen produce shipped from the west coast or Mexico.
- Value is provided to both suppliers and consumers based on the services provided
- The business can stand on its own, not requiring a cash infusion after the initial investment

### **Assumptions and limitations**

For the purposes of this project, there are certain assumptions and limitations that exist. First, it is assumed that the markets that will be explored as potential customers of this product include institutions such as schools, hospitals, senior centers and food banks. Also, although the resulting business will be intended for implementation in the state of Vermont, it will be assumed that the findings of research conducted in other areas of New England will apply in Vermont as well. Finally, the study assumes there is a need for a variety of price points based on institution type, and that it is possible that not all institution types will be serviceable through this plan.

Findings on the effectiveness of a mobile flash-freeze unit will be limited to the experience of Green Mountain College Food & Farm Project and the Rutland Area Food & Farm Link and associated organization's

experimentation with this unit. Data on such experimentation is limited and may not be statistically significant.

In addition, as the majority of this research

and business plan preparation will occur over the winter months, additional experimentation using the unit focused on specific goals of this study will not be feasible.

## References

Coburn, K. (2008, September 12). *RAFFL & GMC host states first mobile flash freeze unit* (Press

Release). Retrieved from Green Mountain College website: <http://www.greenmtn.edu>

Rathke, L. (2011, February 18). Federal grant to help put local foods into N.E. school, hospitals.

*boston.com*. Retrieved from <http://www.boston.com>

Suozzo, A. (2011, August 1). Shumlin plan would trade USDA staples to local foods []. *Addison*

*County Independent*. Retrieved from <http://addisonindependent.com>

# Appendix Item C:

## Cold Storage Options for Small-Scale Diversified Farms in the Northeast

Garland Mason, New Agricultural Markets Research Associate

Green Mountain College Farm & Food Project

December 12, 2012

Contact: [garland@rutlandfarmandfood.org](mailto:garland@rutlandfarmandfood.org)

### Table of Contents

I.	Introduction	3
II.	Cooler Construction Options for all Storage Zones	5
III.	The Storage Zones	7
	A. Cold & Wet Storage (e.g. Root Storage)	
	B. Cool & Moist Storage (e.g. Potato Storage)	
	C. Warm & Dry Storage (e.g. Squash Storage)	
	D. Cool & Dry (e.g. Onion Storage)	
	E. Very Cold & Dry (e.g. Sweet Potatoes)	
	F. Very Cold & Moist (e.g. Brassicas)	
IV.	Other Important Considerations	11
	A. Washing and Packing	
	B. Cooler Considerations	
	C. Pest Control	
	D. Crop Varieties	
V.	Conclusions	15
VI.	Sources Cited	16
VII.	Tools & Resources Cited	17
VIII.	Other Tools & Resources	19
IX.	Farms & Other Sites Visited	20

## I. Introduction

As winter farmers' markets and winter CSAs become increasingly viable as agricultural market outlets, many farmers may choose to invest in improved storage systems in order to maximize the amount, variety and quality of their stored crops. From 2010 to 2011, the number of winter farmers markets in the United States grew from 886 to 1,225, an increase of 38%. Although an expansion of winter markets is good for farmers, there has been a simultaneous increase in the number of vendors at each market. In Brattleboro, Vermont, the winter farmers' market grew from 18 vendors in 2006 to 32 vendors in 2011 (Koch).

To succeed in the winter marketplace many New England farmers are choosing to expand and improve their crop storage in order to store a greater variety of top-quality vegetables. Improved storage capacity adds value to the crops through investment in infrastructure although it may result in increased labor demands throughout the winter.

Alternatively, some farmers seek to streamline storage to minimize winter labor costs. In this case, the quality of stored crops may not be as high, they may not keep as long, or the grower may not store as many varieties, yet the farmer is able to save money on labor and is still able to turn a profit and collect income year-round.

As always, farmers are specializing in a diversity crops, and are using different storage techniques and marketing strategies. In March of 2012, I had the opportunity to visit six farms in Vermont, four in Massachusetts and two in eastern New York, each with innovative and varied storage infrastructure. In Vermont, I also visited Deep Root Cooperative's storage site and the Vermont Food Venture Center. These farms and sites store everything from beets and potatoes to kohlrabi and leeks to eggs and sauerkraut.

Some farmers chose to invest in completely new infrastructure; others chose to work with what they had, including retrofitting old cow barns to fit coolers or repurposing older coolers for winter warm-storage. All of these farmers have chosen to invest in infrastructure that caters directly to their farm systems and their target market. There are markedly different storage styles used by farms participating in wholesale markets, winter farmers markets, farms who sell through self-serve winter CSAs, and farms participating in a combination of the three. Storage types included coolers, root cellars, warm rooms, passive rooms and variations of each.

The diverse storage systems are generally designed to accommodate some combination of the four most common storage zones: cold and wet (i.e. root crop storage); cool and moist (i.e. potato

storage), warm and dry (i.e. squash storage) and cold and dry (i.e. onion and garlic storage). Different types of vegetables require particular storage conditions, but many farmers have found that certain vegetables are more flexible than others, and can be kept in sub-optimal storage while maintaining their high quality. The types of vegetables that can compromise their storage conditions may also depend on the farmer's point of sale. For example, potatoes can tolerate cold and wet, although optimal storage is cool and moist. Potatoes become sweeter in cold and wet storage. If the point of sale is through CSA, and the farmer can be sure that customers don't mind that their potatoes have become sweeter, then it may make more sense to combine potato storage into cold and wet rather than build a separate storage space for potatoes. In this instance, it is within both the customer's and the farmer's financial interest to combine potatoes into cold and wet storage rather than build a new system.

## **II. Options in Cooler Construction for any Storage Zone**

In constructing a cooler, there are a few options: some buy new pre-fabricated box coolers; others build their own coolers either by using all new materials, recycled cooler panels, and/or spray foam insulation. There are many details and considerations that need to be taken into account when building a cooler.

New cooler materials can be purchased as a box-set or as individual panels. The Intervale Community Farm in Burlington, Vermont chose to invest in all new materials and purchased a pre-fabricated box from [Norbec<sup>1</sup>](#), a cooler supply company based in Quebec. There are two flooring options when buying a pre-fabricated box. The first option is to create an insulated floor space beneath the cooler (e.g. an insulated cement slab). The second option is to purchase an insulated floor piece that is part of the box cooler. This allows for some versatility because the cooler can be easily moved to another location in the future. Unless a farm has an existing insulated slab on which to place the cooler, in most cases it makes more sense to purchase an insulated (and movable) floor piece for the pre-fabricated cooler.

Individual insulated panels can be purchased new and assembled into a box. [Stressed-skin panels \(also called structural support panels\)<sup>2</sup>](#) are pre-fabricated insulated panels that can be used for cooler siding. They are very versatile and can be used as a load-bearing wall or as roof insulation. Stressed-skin panels are used at Pete's Greens in Craftsbury, Vermont.

Another option is to use recycled cooler panels to create a cooler space. Two of the farms I visited sourced their used panels from American [Wholesale Refrigeration<sup>3</sup>](#) based in Cleveland, Ohio. It is also possible to create homemade panels using a combination of foam board insulation and vinyl siding

or metal roofing. In homemade panels plywood is also used as siding. Plywood is an undesirable choice for cooler interiors (after vinyl or metal) because wood can hold crop diseases and could potentially re-infect crops each year. Also, plywood is not thoroughly washable and can present a food safety issue.

Polyurethane spray foam insulation is incredibly versatile and relatively inexpensive. Spray foam creates an insulated envelope with a tight seal that is highly effective at maintaining temperature and humidity. Spray foam should be applied to a frame created for the cooler. The cooler frame is similar to a frame built for a standard wall and can be built using wood or metal. If wooden framing is used, the wood must be completely sealed by the foam on the interior of the cooler to prevent it from rotting from high humidity. Wood should not be sealed on all sides, however, because moisture gets trapped within the wood, rotting the frame from within the foam. Sealing the wood on the inner walls also prevents potential issues of crop disease and food safety concerns. When using metal framing one must be aware of its potential to act as a thermal conductor. If exposed metal framing travels from within the cooler, through foam insulation and continues to be used as a support structure outside of the cooler, the metal will act as a thermal conductor drawing warm air into the cooler and cold air out of the cooler.

It is relatively easy to achieve an r-value of 50 or higher using spray foam insulation. High density spray foam has a better r-value per square inch so the coating can be thinner while maintaining insulation capacity. Spray foam is flammable which may be a concern for some. Some types of spray foam are more flammable than others. The flammability of certain spray foams can also be mitigated through the use of sealants and other products marketed as spray foam coatings. When using sealant or coating, it is important to ascertain whether the product in question will stand up to the cold, high-moisture conditions inside the cooler. Before investing the time, energy and expense to coat the entire cooler sealant it may be worth double-checking with the manufacturer and perhaps trialing the product in one section of the cooler. Lee and Ruth Blackwell of Blackwell Roots Farm in Cabot, Vermont have found that liquid rubber by Ames Research<sup>4</sup> works well for them as a spray foam coating.

Kilpatrick Family Farm in Middle Granville, New York uses insulated overseas shipping containers to achieve cold and wet (and cold and dry) conditions. These containers are well insulated, self-contained with no additional structure needed to cover it. A compressor and evaporator are retrofitted to fit the container. A grooved floor allows water to be dumped onto the floor without the produce coming into direct contact with the water. Similarly, some farms use a refrigerated trailer from a tractor-trailer to store produce in a cold and wet (or cold and dry) environment.

For more information on cooler construction see *Cooler Considerations* (page 12).

### III. The Storage Zones

Each crop has specific requirements for storage. It is important to be aware of the ideal storage requirements of each crop and also how tolerant each crop is to a deviation to ideal storage conditions. The most comprehensive and detailed information about each crop's storage requirement and sensitivity can be found in the USDA's Agriculture Handbook 66<sup>5</sup> *The Commercial Storage of Fruits Vegetables, Florist and Nursery Stocks*. This handbook is considered to be one of the best sources of information available to farmers in the US as it covers almost every fruit, vegetable and nut that can be grown in the country. The handbook was originally released in 1986. A revised version of the handbook was released in 2004 and can be found online at <http://www.ba.ars.usda.gov/hb66/contents.html>.

There are four commonly identified storage zones for crops grown in the northeast. They include cold & wet (e.g. root storage) which ranges from 32-40° Fahrenheit and 90-95% relative humidity (RH), cool and moist (e.g. potato storage), 38-40°F and 80-90% RH, warm and dry (e.g. squash storage) which requires 50-60°F and 50-70% RH, and cool and dry (e.g. onion storage), 40-50°F and 60-70% RH (Fact Sheet, Whole Farm Services).

#### A. Cold & Wet Storage (e.g. Root storage)

*32-40° Fahrenheit and 90-95+% relative humidity*

Creating cold and wet storage is usually achieved using a traditional cooler, with conventional compressors and evaporators. Many farmers find that the most effective way to add humidity is through the use of foggers, misters, or humidifiers. Intervale Community Farm uses the [Aqua Fog Hidro](#)<sup>6</sup>, Blackwell Roots uses the [Netafim Coolnet Fogger](#)<sup>7</sup>, and the Tangerini's Spring Street Farm uses an automatic humidifier and mister manufactured by [Smart Fog Humidification Systems](#)<sup>8</sup>. Others add humidity by simply pouring water onto the cooler floor. Generally, the desired humidity level is 95% or above.

In an effort to combine storage of vegetables needing different storage conditions some farms are coming up with innovative solutions to accommodate various crops in a single cooled space. In Montague, Massachusetts, Red Fire Farm stacks crops needing cold and wet conditions in plastic bins on pallets. They place wet burlap both underneath and on top of the bins before wrapping the entire pallet in plastic. They may also include water reservoirs within the containers depending on the humidity requirements of the crop. This allows the humidity level in the immediate vicinity of the produce to stay relatively high while the rest of the cooler can serve as cold and dry storage for a crop like potatoes. The

plastic-wrapped pallet method also works particularly well if a farm needs to rent space in a commercial cooler that is not designed for produce. Such is the case of several farms in the Pioneer Valley who rent pallet space in cold storage at [Pioneer Cold](#)<sup>9</sup>.

## **B. Cool & Moist Storage (e.g. Potato Storage)**

*50-60°F and 50-70% relative humidity*

Although it is possible to store potatoes in cold and wet storage, this type of compromise leads to sweeter tasting potatoes and potentially shorter storage ability. Optimal storage for potatoes hovers at 38-40 degrees and 80-90% humidity (Whole Farm Services). Cool and moist storage is generally achieved using the same types of cooler insulation previously mentioned.

Some farmers find that the enhanced storability of potatoes when kept at their optimum conditions is valuable enough to designate a separate space for potato storage. The storability and quality of stored potatoes also depends heavily on post-harvest handling and proper curing. Most farmers find that potatoes store best when they are not washed going into storage but are washed only as they come out of storage to be sold. Potatoes should be sorted and culled prior to storage and again as they are packaged for sale.

Potatoes should be cured at 50-60 degrees Fahrenheit with about 95% humidity for 10 to 14 days (Yanta). Curing can be accomplished through the use of a [Cool-bot](#)<sup>10</sup> and humidifier in an insulated space. Cool-bots can create optimum potato storage conditions post-curing. They are most effective at maintaining storage temperature when appropriately scaled. Cool-bots are not recommended for space much larger than 1100 cubic feet.

Potatoes can also be stored passively. Blackwell Roots Farm in Cabot, Vermont has two designated spaces for potatoes, one passive and one cooled with a Cool-bot. In the passive room the temperature is maintained by two stovepipes that exhaust warm air and bring in cool air. The intake pipe that brings in cold air comes down from the ceiling and ends just a few feet from the floor. The exhaust pipe is higher, ending closer to the ceiling to capture rising warm air. Blackwell uses this room only to cure potatoes in the fall but it is likely that with enough thermal mass to keep the room from freezing, one could store potatoes passively with minimal electricity. Another possibility for a passive room would be to install fans within the stove pipes and have the fans connected to thermostatic switches. The exhaust fan would turn on as the room became warm and the intake fan would turn on to bring in more cool air. As the stored potatoes are sold and the thermal mass diminishes over the course

of the storage season, it may be necessary to consider including a small electric space heater on a thermostatic switch that would keep the room from freezing.

**C. Warm & Dry Storage (e.g. Squash Storage)**

*50-60°F and 50-70% relative humidity*

Warm and dry storage can be accomplished relatively simply. Many farmers use older coolers no longer needed for cold storage. These coolers can create ideal storage conditions for squash with the addition of a small electric heater on a thermostatic switch. Air circulation is particularly important in squash storage.

Eric Rozendaal of Rockville Market Farm stores several thousand pounds of squash annually. He chose to construct a separate heated building for squash storage that consists of a large metal building with eight-inch thick spray foam insulation. Rozendaal chose to heat the building using radiant propane heat below the concrete floor. Rozendaal believes that radiant heat works better than forced air when storage is at full capacity. Ideally, Rozendaal would have a heat exchanger that he could run when the storage is at full capacity.

**D. Cool & Dry (e.g. Onion Storage)**

*40-50°F and 60-70% relative humidity*

When planning a cold storage system, onions are not generally allotted a storage space that meets their ideal storage conditions (cool and dry). This is because onions are tolerant to being stored at less-than-ideal conditions. Many farmers are able to find appropriate storage for onions outside of designated cooler space. Onions can be given supplemental heat that prevents them from freezing by placing them near the exhaust of a Cool-bot or cooler compressor. Most farmers are able to find a good place for onions adjacent to the coolers because they store well at the ambient temperature of most barns that are in-use through winter. Certain alliums such as leeks, ramps and chives are best stored with root crops in cold and wet storage.

**E. Very Cold & Dry (e.g. Sweet Potatoes)**

*32-38°F and 60-70% relative humidity*

Sweet potatoes are becoming an increasingly popular crop to grow in southern Vermont and adjacent eastern New York and western Massachusetts. This rise in sweet potato production has dictated an increased need for sweet potato storage. Sweet potatoes have unique storage requirements

in that their optimal storage conditions are very cold and dry, around 32-38 degrees Fahrenheit and between 60-70% humidity (Whole Farm Services). Cold and wet storage for root crops is too humid for sweet potatoes. The cool and moist storage for potatoes is too warm and too humid, and the warm and dry storage for squash is too warm for sweet potatoes. However, sweet potatoes may be tolerant to any of these less than ideal storage conditions. Paul Arnold of Pleasant Valley Farm in Argyle, New York has found success in storing sweet potatoes with squash when stored in the washroom, closed in by standard (not super-insulated) garage doors. A vent-less propane heater adds heat and also humidity as a by-product. Additional moisture is added by the weekly washing of roots in the same room. As a high-value crop, many farmers may choose to build storage that suits sweet potatoes' unique conditions.

#### **F. Very Cold & Moist (e.g. Cabbage & Other Brassicas)**

*32-38°F and 80-90% relative humidity*

Cabbage (and other brassicas) can store well in cold and wet conditions but humidity may become an issue. Brassicas prefer between 80 and 90% humidity and may show signs of rot or disease when stored at humidity above 90%. One way to offset this is to store them in bins with lots of air circulation. For smaller quantities, brassicas can be packed single layered in an open-top stackable plastic bin. For larger quantities, plastic (or wooden) bulk bins can be used with adequate air circulation. Dan Kaplan of Brookfield Farm has found an interesting solution that works for him. Dan operates a self-serve winter CSA and has found that his cabbage quality stays highest if he wraps each head individually in newspaper and packs it in a single layer into a small plastic bin. When storing cabbage it is inevitable that a certain number of outer layers will have to be removed due to rot or disease (or both). Good cabbage storage will minimize the number of wrapper leaves to be peeled off, decreasing crop loss. Some find that certain types of disease or rot can be tasted in the final product, even after the visibly affected leaves have been removed.

#### IV. Other Important considerations:

There are many details to consider that could easily be overlooked when constructing a storage system. Listed below are some tips and hints I gleaned from my research trip.

##### A. Washing & Packing

**Wash Stations** can be an important part of crop storage systems. Many farmers choose to wash almost all of their crops going into storage. Farmers who store produce through winter are likely to need certain parts of a wash station set up indoors during the winter to wash potatoes at the very least. Wash stations are increasingly moving indoors due to concerns about complying with GAP Certification (USDA Good Agricultural Practices, described below) which mandates that “packing facilities must be enclosed.” An indoor wash station is inevitably more versatile because it can be used throughout the year.

Wastewater from wash stations must be properly drained. Larger operations use settling tanks, perhaps followed by a leach field or gravel filter. A local NRCS officer or the conservation district may want to have input in the way the wastewater is captured and treated, depending on the size and location of the operation. It is generally worth checking with NRCS before installing a wastewater capture system.

There are various approaches to **washing storage crops**. Some farmers choose to wash the produce as it enters storage. Advantages to washing immediately after harvest include the availability of summer labor and the immediate removal of soil which causes staining and could potentially contain pathogens. Others wash and grade produce as it is taken out of storage for sale. Advantages to washing immediately prior to sale include washing at a less busy time of year and potentially increased storage quality (arguable for either method depending on crop). Staining from soil can be an issue in carrots when they are stored unwashed. Paul Arnold and Michael Kilpatrick claim that washing carrots in a barrel washer using high water pressure can remove staining, although the effectiveness of this method may depend on the soil type in which the carrots were grown. In 2010, Jericho Settlers Farm completed a study that examined the correlation between carrot staining and washing and storing methods. The study showed that carrots harvested and washed same day, put into cold storage immediately after washing had the least amount of staining after six-months of storage while maintaining marketable quality based on crunchiness and sweetness (Alexander).

**GAP Certification**<sup>11</sup> (Good Agricultural Practices as defined by the USDA) is of growing concern to many farmers who are looking to expand into institutional and wholesale markets. GAP's protocols have established certain specific standards for packaging and storage which can be viewed online (<http://www.ams.usda.gov/AMSV1.0/getfile?dDocName=stelprdc5097151>).

## **B. Cooler Considerations**

**Air-circulation** is essential in all storage but is especially important in cold and wet storage. Adequate air circulation can help minimize diseases like fusarium rot that become a problem at extremely high humidity. Methods that increase air circulation in cold and wet storage include leaving space in the produce bins to allow for air movement between stacked bins and leaving space between the bins and the walls. In dry storage (e.g. squash storage), fans are a good option to keep the air moving. This helps maintain the desired temperature throughout the stored product and may also help reduce rot.

**Low-velocity fans** are helpful in lessening energy costs and reducing moisture loss from the produce. Evaporator fans should be low velocity and/or should only run when the compressor is on. Compressor sizing is also an important consideration that needs to be taken into account. A compressor needs to be powerful enough to quickly remove all field heat from produce, but also small enough to maintain cool temperatures without excessive energy consumption. Here there are two clear options: the first is to find a compressor that is self-adjusting to run on fewer horsepower once field heat is removed. The second option is to buy two equally-sized smaller compressors that run simultaneously while field heat is being removed. Once produce is cooled, only one compressor will run. The advantage of the second option is that there is a back-up compressor if the first compressor were to fail. Some farms may choose to use a single smaller compressor and remove field heat by other means (e.g. by using an ice bath). Removing field heat becomes a nonissue with fall-harvested roots and brassicas when harvested at cold temperatures.

Another energy-saving invention is the [Free-Aire System](#)<sup>12</sup>, a “cold-air economizer” which can help lower energy costs by pulling in cold air during the winter time to maintain the coolers at temperature. Free-Aire systems for produce introduce dry outside air during the cold winter months so it is essential to include an effective humidification system, either with humidifiers, misters or foggers, by packaging produce to minimize humidity loss, or both. The Free-Aire system adds start-up infrastructure costs but will save on energy costs over time. A cost comparison can be calculated to find out whether the Free-Aire system will be cost effective to install. For Vermont residents: [Efficiency](#)

[Vermont<sup>13</sup>](#) may have rebates available to offset some of the costs associated with the installation of Free-Aire.

**Cooler doors** are an important consideration; the wrong door in the wrong place can prevent logical flow of produce in and out of the cooler resulting in dramatically reduced efficiency. Sliding doors are generally superior to doors that open out because they do not create a vacuum effect that pulls cold air out and replaces it with air at ambient temperature and humidity. Sliding doors are best suited for small- to medium-sized coolers. [Frank Doors<sup>14</sup>](#) were recommended by Lee Blackwell. For bigger coolers that will be loaded and unloaded with a forklift or tractor a well-insulated garage door will likely be needed. For large coolers with lots of traffic, cloth doors, such as the [Rytec<sup>15</sup>](#) brand door, might be worth considering. Because these stand up well to being bumped by machinery, they may have fewer technical issues than a traditional garage door. In all coolers, **plastic curtains** immediately inside the cooler door help maintain internal temperature. Again, for Vermont residents: [Efficiency Vermont<sup>13</sup>](#) may have rebates available to offset some of the cost of cooler doors.

**Lighting** is often overlooked in the construction of a cooler or root cellar. In selecting the type of lighting, it is important to find bulbs that can turn on quickly at cold temperatures. Many compact fluorescent bulbs are slower to brighten at cold temperatures and may never be as bright as they would be at a warmer temperature. For this reason, Tony Lehouillier of Foote Brook Farm in Johnson, Vermont uses and recommends T8 fluorescent bulbs. Shatterproof or shatter resistant bulbs or a protective guard around a light bulb are also important considerations. Shatterproof or protected lighting is required for GAP certification.

**Cellulose insulation** (derived from recycled paper material) is becoming increasingly popular for use in coolers, wash stations and pack houses. Cellulose insulation is relatively inexpensive and can provide a high r-value. Installing effective moisture barriers is essential when using cellulose insulation. Ideally cellulose insulation is used only in exterior walls where the inner wall has a moisture barrier and the exterior side is able to shed moisture. Cellulose insulation is used in the exterior walls of the packing house and cooler space at Pete's Greens in Craftsbury, Vermont, and in the walls of the wash house at Red Fire Farm in Montague, Massachusetts.

**Cool-bots<sup>10</sup>** are popular as a cost-effective replacement for an evaporator and compressor in small coolers (less than about 1100 cubic feet). Cool-bots are a device that allows the user to override the temperature controls on a standard air conditioner (Cool-bot recommends LG brand). Cool-bots are effective at maintaining temperatures but are slow to remove field heat from a large mass of produce. They also have a tendency of icing-up when cooling a large thermal mass of vegetables. Their best

application may be cooling small amounts of produce as they move in and out of the cooler during the summer months, or maintaining the temperature of produce that has already been cooled. The Cool-bot website (<http://storeitcold.com>) has extensive information, including tips for success when using Cool-bots.

### C. Rodent & Pest Control

**Rodents and pests can become a costly issue in any type of crop storage system.** Prevention and careful management is crucial in avoiding large losses. Some systems have more trouble eradicating pests than others. For example, storage systems built into existing structures generally have more rodent problems than those that are built as new freestanding structures. All of the farms I visited had a pest management program in place that involved some combination of bait and traps. Paul Arnold of Pleasant Valley Farm in Argyle, New York has found success using [Agrid3<sup>16</sup>](#) which is an OMRI-approved ([Organic Materials Research Institute<sup>17</sup>](#)) rodenticide made from vitamin D3. Lee Blackwell of Blackwell Roots credits the air-tight envelope formed by the spray foam insulation with his success in pest control. As he explained, if a rodent can't smell the produce stored on the inside of the cooler they will be less motivated to dig through the insulation looking for food. At Pete's Greens, their newly created storage and packing house sits on a cement slab with a three foot curb. The cement curb has prevented the infiltration of rodents and other pests, and as of March 2012, they had not had any issue with rodents. In any storage system, the manager must always be vigilant for signs of rodents, constantly checking and replacing bait stations and traps so that extensive crop loss from rodent damage does not become a problem. Producers can look to OMRI for an up-to-date list of organic-approved pesticides and rodenticides by following this link: <http://www.omri.org/simple-opl-search/results/Processing%20Pest%20Controls>.

### D. Crop Varieties

Of course, the varieties a farmer chooses to grow play a significant role in both the quality and the longevity of stored produce. **Growing varieties that have been bred and proven to store well is essential to successful storage.** In production planning it is imperative to consider which varieties of crops to grow for fresh sale and which varieties to grow for storage.

## **V. Conclusion**

The caliber and diversity of the storage sites I visited for this study demonstrates the creativity and innovation of the farmers who built them. The farmers' thoughtfulness and careful consideration in their design and decision-making is exemplary.

Chris Callahan, University of Vermont-Extension's Agricultural Engineer, has recently completed a survey of farmers in Vermont. The results of the survey told not only of the types of storage in use in the state but also of farmers' understanding and their need for more information. The survey confirmed the degree of diversity among Vermont's farming community. Winter market outlets were dominated by wholesale (74% sell to this market), but sales to the retail sector and through farmers markets and winter CSA were equally divided with 38-41% reporting sales to each. Many storage systems were represented in the survey including walk-ins, heated winter storage, root cellars, and cool-bots. The survey's major finding was the unexpectedly high degree of interest in learning about storage systems. Callahan is now working on the creation of a UVM-Extension course designed to help farmers understand and evaluate their cold storage options.

Much remains to be learned in the optimal storage of vegetables for small- to mid-scale diversified farms. As I've come to understand through this study, in order to make an informed decision about improving crop storage through infrastructure improvement, there are a great many things to consider. Consideration of economics and end-markets ultimately weigh heavily in a farmer's decisions regarding infrastructure investments for crop storage and are not fully-examined in this study. Each farmer must examine these factors individually; taking into consideration the goals he or she holds for the farm.

There are many subtle nuances that must be considered in the creation of a storage system. It was my intention in writing this narrative to bring as many of those subtleties to light as possible so farmers do not have to learn of them "the hard way."

## **VI. Sources Cited:**

Alexander, C. "Summary Report for Season Extension and Winter-Growing On-Farm Research: Winter Carrot Storage Techniques to Maintain Quality and Minimize Staining." 2010. Northeastern Organic Farming Association of Vermont. <http://nofavt.org/sites/default/files/JerichoSettlers.pdf>. Accessed 10/8/12.

Koch, Wendy. "Farmers markets go year-round as eat-local trend grows." *USA Today*. 20 Dec 2011: n. pag. Web. <http://usatoday30.usatoday.com/money/industries/food/story/2011-12-21/year-round-farmers-markets/52128314/1>. Accessed 3/27/12.

United States Department of Agriculture. (2011). "Winter Farmers Markets Expand: Now More Than 1,200 Locations for Fresh Local Foods". Press Release. <http://www.usda.gov/wps/portal/usda/usdahome?contentid=2011/12/0516.xml&contentidonly=true>. Accessed 10/8/2012.

Whole Farm Services. "Storage Crop Conditions Chart: Seeding, Harvesting, Storage Schedule. Fact Sheet. [http://wholefarmservices.com/documents/CropStorageConditionschart\\_000.pdf](http://wholefarmservices.com/documents/CropStorageConditionschart_000.pdf). Accessed 10/8/12.

Yanta, James P. Tong, Cindy. "Commercial Post-Harvest Handling of Potatoes (*Solanum Tuberosum*)."  
University of Minnesota-Extension. 2012.  
<http://www.extension.umn.edu/distribution/horticulture/DG6239.html>. Accessed 3/26/12.

## **VII. Tools and Resources Cited:**

1. Nor-Bec (based in Quebec)  
Source of pre-fabricated cooler boxes and other materials  
Used at Intervale Community Farm  
<http://www.norbec.com/>
2. Stressed Skin Panels/Structural Insulated Panels (SIPs)  
Foam Laminates of Vermont is a SIP manufacturer (based in Vermont)  
Recommended by Isaac Jacobs at Pete's Greens  
[http://www.foamlaminates.com/structural\\_insulated\\_panels.html](http://www.foamlaminates.com/structural_insulated_panels.html)
3. American Wholesale Refrigeration  
Source of used cooler panels and other materials  
Used at Kilpatrick Family Farm and Red Fire Farm  
<http://www.awrco.com/>
4. Ames Research- Liquid Rubber  
Used as spray foam sealant  
Used at Blackwell Roots  
<http://www.amesresearch.com/>
5. USDA Agriculture Handbook Number 66: The Commercial Storage of Fruits, Vegetables, and Florist and Nursery Stocks  
A comprehensive publication on storage requirements of most crops grown in the U.S.  
<http://www.ba.ars.usda.gov/hb66/contents.html>
6. Aqua Fog Hidro  
Humidifier for cold and wet storage  
Used at Intervale Community Farm  
[http://www.cloudtops.com/misting\\_fans\\_fog\\_fans/aquafog700.php](http://www.cloudtops.com/misting_fans_fog_fans/aquafog700.php)
7. Netafim Coolnet Fogger  
Greenhouse fogger, can be used for humidity in cold and wet storage  
Used at Blackwell Roots Farm  
<http://www.netafimusa.com/greenhouse/products/foggers>
8. Smart Fog Humidification Systems  
Humidifiers and misters that can be used in cold and wet storage  
Used at Tangerini's Spring Street Farm  
<http://www.smartfog.com/>
9. Pioneer Cold  
Cold storage space for rent, used by some Pioneer Valley Farmers  
Chicopee, MA  
<http://www.pioneercold.com/>

10. Cool-bot (based in Vermont)

A/C unit to cooler compressor converter

Used by Blackwell Roots, Jericho Settlers', and others

<http://storeitcold.com/>

11. USDA-Good Agricultural Practices

User's Guide

Part 3: House Packing Facility (p 17-20)

Part 4: Storage and Transportation (p. 20-21)

<http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=stelprdc5097151>

Checklist:

Part 3: House Packing Facility (p 14-17)

Part 4: Storage and Transportation (p. 17-21)

<http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5091326>

12. Free-Aire Refrigeration (based in Vermont)

Cold air economizer

Used at Intervale Community Farm, previously used at Pete's Greens

<http://freeaire.com/>

13. Efficiency Vermont

Energy efficiency consulting, energy efficiency rebates for Vermont businesses

[http://www.encyvermont.com/for\\_my\\_business/ways-to-save-and-rebates/Refrigeration/rebates.aspx](http://www.encyvermont.com/for_my_business/ways-to-save-and-rebates/Refrigeration/rebates.aspx)

14. Frank Doors

Cooler doors

Used by Lee Blackwell and others

<http://www.frankdoor.com/index.php>

15. Ryttec Doors

Cloth overhead doors

Used by Pete's Greens

<http://www.rytecdoors.com/industry/?id=11>

16. Agrid3

Organic pest control

Used by Paul Arnold

[http://www.motomco.com/p\\_agrid.htm](http://www.motomco.com/p_agrid.htm)

17. Organic Materials Review Institute

Review of pest control systems

<http://www.omri.org/simple-opl-search/results/Processing%20Pest%20Controls>

## **VIII. Other Tools and Resources:**

Alpine Refrigeration (based in Vermont)

Refrigeration specialists, consulting and materials, dealer for Free-Aire systems

Used by Blackwell Roots

1532 Hill Street Ext, Montpelier, VT 05602

802-229-0074

American Warehousing

Source of used cooler panels and other materials

Used by Tangerini's Spring Street Farm

<http://www.americanwarehousing.net/index.htm>

Davis Weather Station

Wireless temperature and humidity alert system

Used by Pleasant Valley Farm

<http://www.davisnet.com/weather/index.asp>

NOFA-Vermont

On-farm research studies of carrot and squash storage

<http://nofavt.org/programs/technical-assistance-education-vegetables/winter-growing-research-results>

Stone Brothers Inc (based in Vermont)

Installation of cooling systems

Used by Deep Root Cooperative

47 East Hill Ext, North Troy, VT

802-988-2373

RC Soule of Dick Soule Inc (based in Vermont)

Installation of cooling systems

Used by Intervale Community Farm and Jericho Settlers' Farm

3598 VT Route 105, Enosburg Falls, VT 05450

802-933-6167

Winter Panel Company (based in Vermont)

Source of cooler panels, structural insulated panels, and other materials

Used at Kilpatrick Family Farm

<http://www.winterpanel.com/>

Whole Farm Services (based in Vermont)

Crop Storage Systems Consulting Service

[http://wholefarmservices.com/crop\\_services.shtml](http://wholefarmservices.com/crop_services.shtml)

**IX. Farms Visited:**

Blackwell Roots Farm  
Lee and Ruth Blackwell  
Cabot, Vermont

Brookfield Farm  
Dan Kaplan and Karen Romanowski  
Amherst, Massachusetts

Foote Brook Farm  
Tony and Joie Lehoullier  
Johnson, Vermont

Jekanowski Potato Farm  
Paul Jekanowski  
Hadley, Massachusetts

Jericho Settlers' Farm  
Christa Alexander and Mark Fasching  
Jericho, Vermont

Kilpatrick Family Farm  
Michael Kilpatrick  
Middle Granville, New York

Pete's Greens  
Pete Johnson  
Craftsbury, Vermont

Pleasant Valley Farm  
Paul and Sally Arnold  
Argyle, New York

Red Fire Farm  
Ryan and Sarah Voiland  
Montague and Granby, Massachusetts

Rockville Market Farm  
Eric Rozendaal  
Starksboro, Vermont

Tangerini Farm  
Charlie and Laura Tangerini  
Millis, Massachusetts

**Other Sites Visited:**

Deep Root Cooperative Storage Facility  
Anthony Mirisciotta, Manager  
Johnson, Vermont

Vermont Food Venture Center  
Monty Fischer, Executive Director  
Hardwick, Vermont

## Appendix Item D:

### AGM Common Report Form

---

Check One: ☐ Interim Report (Submit only this cover sheet)  
☒ Final Report (Submit this cover sheet and complete page 2 using no more than three pages.)

Submitted to: The Windham Foundation      Date: \_\_\_\_\_

Name of Organization: Green Mountain College

Fiscal Agent (if different from your organization): Not Applicable

Program Name (if applicable): Farm and Food Project

Grant Amount: \$10,000

☐ General Operating      ☒ Project Support  
☐ Challenge Grant      ☐ Capital/Endowment

Please provide a complete expense report indicating how the grant award was used.

Please respond to each of the following questions using up to 3 (three) pages in total, not including the cover page. Your responses should focus specifically on the funded project or program, if applicable, or in the case of general operating grants, on your entire organization.

1. Referring to the goals and objectives described in your original grant request (or any revisions submitted subsequent to the grant award), please indicate the following:

Two goals were identified in our original proposal. The long term goal of the Community Commercial Kitchen Project is to create new economic opportunity for farmers and food entrepreneurs and improve access to fresh local foods for all segments of the population in Rutland County. This goal is ongoing.

The short term goal of the proposal was to make the Community Commercial Kitchen fully operational for processing and training through the purchase of small wares and basic appliances. We have succeeded in meeting this goal.

The funding received from the Windham Foundation was instrumental to the creation of a fully equipped commercial kitchen available for rent by the community. With this funding we were able to purchase a complete set of stainless steel cookware, knives, mixing bowls,

as well as certain essential small appliances such as a commercial scale food processor, stand mixer, and blender. The grant also provided the opportunity to make larger infrastructure improvements including the creation of a loading dock that facilitates the movement of large amounts of produce and other ingredients into the kitchen. We were also able to upgrade our cookware storage by creating a well-organized closet with several locking compartments. Additionally, we created an outdoor cob-oven that provides an alternate cooking and event space for those using the kitchen.

These purchases and infrastructure improvements have positioned us to successfully fulfill our long term goal of creating economic opportunity and accessibility to local food. We currently have one food entrepreneur who rents the kitchen on a weekly basis. We also have renters that use the kitchen to cater events and renters that come in to process produce during the height of the growing season. We will continue to recruit farmers and food entrepreneurs to use the kitchen and we anticipate an increase in the number of regular renters with the cookware and infrastructure now fully in place.

During the 2013 growing season over 4,200 pounds of local produce were processed in the community commercial kitchen. Of that produce about 3,500 pounds were for use in the College dining hall and 700 pounds were distributed to six charitable food sites in Rutland County.

2. Describe any setbacks encountered during the period of this grant.

In designing and stocking the commercial kitchen for multiple users and varied use, we discovered the need to streamline kitchen use and improve knowledge of food safe practices. We have ensured that all products produced in the shared space will be safe by creating and enforcing a set of protocols and procedures. These documents are included in this report. To further promote food safety, Green Mountain College hosted a two-day class taught by Londa Nwadike, University of Vermont-Extension Food Safety Specialist. This class will be taught on a regular basis and will be offered to the community as well as to Green Mountain College students.

3. Who else has funded this project (or your organization), and at what level? If total proposed budget amount was not raised, indicate if program goals were altered in any way.

The research funded by Jane's Trust, which was centered on the use of the Vermont Agency of Agriculture's flash-freeze unit, made use of the fully-equipped commercial kitchen as a central hub during the 2012 growing season. The kitchen hosted the pilot of the Vermont Commodities Program spearheaded by Salvation Farms. The pilot made use of the kitchen to process and freeze donated local produce to trial various products and package for use within the charitable food system. Following the pilot year, Salvation Farms will have outgrown our small kitchen but this space has proven to be an essential starting point to what will likely become a large statewide program in the future.

Jane's Trust funded the purchase of certain equipment needed for processing and packaging produce on a large scale. This included the purchase of a commercial vacuum sealing machine. Jane's Trust also provided the funding for the food safety course which made use of the commercial kitchen. Funding from that grant was also used to purchase cleaning supplies and to hire a linen service that provided a weekly delivery of aprons and dishcloths.

4. What steps are being made to ensure the sustainability of your project or organization beyond this grant period?

Following the end of the grant period, a part-time staff person will be hired to manage kitchen use and to maintain cleanliness. A food safety course and other relevant skill-building training will be offered on a regular basis and will be open to the community.

The installation of an edible landscape and teaching garden funded by a grant from Duke Energy will make use of the kitchen for community-oriented programming, teaching basic cooking skills and food preservation.

The kitchen manager will continue to work to promote the kitchen and to recruit renters. Rental income will provide enough revenue to make this project partially self-sustaining. It will provide the means to purchase the chemicals used in the three-bay sink and the dishwasher as well as to support the continuation of the linen service.

We will continue to strive towards fulfilling our long term goals of enhancing economic opportunity and increasing access to local foods.

# Appendix Item E:

## Solar Harvest Center Community Commercial Kitchen Policies & Procedures

### **Kitchen Orientation and Requirements**

All users must attend a mandatory orientation session to become acquainted with the Solar Harvest Center's Community Commercial Kitchen (CCK) policies, operating procedures and to gain a basic understanding of food safety.

It is recommended that kitchen users enroll in the *Introduction to Food Safety in Value-Added Food Production* course offered each semester.

Note: additional orientation will be required to use the vacuum sealer machine or the flash-freeze unit.

### **Kitchen Scheduling:**

The SHC CCK is reserved based on space availability on a first come, first served basis.

Reservations must be made at least four days in advance. Please be sure to consider the time it will take to clean the kitchen when booking your reservation.

Reservations cancelled with four days notice or less will incur a \$25 booking fee.

To make a reservation email Sam, [Dixons@greenmtn.edu](mailto:Dixons@greenmtn.edu)

To review what dates are available, or to confirm a reservation, please refer to the Kitchen's Google calendar.

Please be sure to schedule your work needs in advance to ensure that space is available at the time you need it.

Only certified users may make a reservation to use the CCK. To become certified to use the kitchen please email the Kitchen Manager to schedule an orientation.

A \$150 security deposit must be on file at least four days prior to your reservation. If a security deposit has not been received and no other arrangements have been made your reservation will be automatically cancelled. No individual or group may use the kitchen without a security deposit on file.

### **Regular Cleaning:**

All SHC Kitchen users must clean the kitchen before the end of their shift. The CCK Kitchen Inspection Checklist will be used by all Kitchen users and their staff or volunteers to monitor the cleaning activities and success of the Kitchen. Failure to utilize the CCK Kitchen Inspection Checklist and/or failure of a CCK user and/or user's staff/volunteer's cleaning methods to pass inspection by a CCK representative may result in a fine charged at the rate of \$25 per incident and the cost incurred to return the CCK to its required cleanliness. To avoid fines please follow the cleaning protocol.

The CCK is subject to regular, invited and frequent inspections by city, county, state and federal inspectors in accordance with all applicable laws and inspection mandates.

#### **Access to CCK:**

The CCK remains unlocked during normal business hours (8 am-5 pm Monday-Friday). To gain approved access to the kitchen during non-business hours, users will be provided with the phone number of Campus Security who will come unlock the kitchen for pre-approved users.

In some cases kitchen users may be provided with a key to the kitchen or to one or more of the closet cabinets. Users provided with a key to the CCK or to any of the closet cabinets will be responsible for the key, the status of the kitchen, and all items in the kitchen and in the cabinet(s) for which the user has a key. Any loss or damage to the CCK during the time the user is in possession of the key may result in a fine to be assessed following return of the key. A lost cabinet key will result in a \$50 replacement fee; a lost key to the kitchen will result in a \$100 replacement fee.

#### **Other regulations, policies and procedures**

All users of the Solar Harvest Center Kitchen must comply with the following:

- 1) Long hair must be tied back in a braid or bun, shorter hair must be covered with a hairnet or hat.
- 2) Wear clean outer garments and closed-toed shoes.
- 3) Wash hands frequently with soap before starting work, after each absence from the work area, after use of the restroom and any time hands become soiled or contaminated. Dry hands with paper towels. Hands may be washed in the kitchen's hand sink or in the bathroom sink.
- 4) Gloves must be worn when preparing ready-to-eat foods.
- 5) Remove loose jewelry and hand jewelry.
- 6) No person afflicted with an open cut, infected wound, boil or communicable disease may work in any capacity in the kitchen.
- 7) No smoking is allowed in or around any part of the building or farm.
- 8) No animals are allowed to enter the kitchen or dining room.
- 9) Wipe up spills as they occur and sanitize surfaces before using kitchen, as needed, during use and when production is completed.
- 10) No pesticides, hazardous materials or detergents may be used when preparing food products.
- 11) Clean up floors and mop up floor spills as needed during use. Clean and mop the floor after production is completed. Kitchen must be left clean and ready for next use (as described below). Leaving the kitchen unclean will result in a fine.
- 12) Dispose of empty containers, boxes, and wrappers.
- 13) Turn off, clean, and return equipment to storage position when no longer needed.
- 14) Wash dirty dishes, pans, pots and utensils in the three-bay sink with the furnished cleaning products and final rinse with sanitizer, or use the dishwasher as directed.
- 15) Secure items used in the closet, properly close doors and check out by the prescribed procedures

#### **Security Deposit, Fines & Fees:**

A \$25 fine will be incurred if:

- Debris is found on stove, in crumb trays
- Debris or cookware is found in sink
- Floor is not mopped or insufficiently mopped
- Unauthorized or unlabeled food is left in the refrigerator or freezer

- Cookware is left out of the closet
- Trash and compost has not been removed from the space

A \$50 fine will be incurred if:

- Debris is left in hand sink

A fine will be assessed if:

- Cookware is damaged or broken
- An appliance is damaged or broken
- If cookware or an appliance is missing following use
- Excessive cleaning is required to return the kitchen to a useable state

For student groups using the kitchen fines will be incurred by the individual who makes the reservation. Fines will be charged directly to the student's account.

A \$50 replacement fee will be charged for each lost cabinet key

A \$100 replacement fee will be charged for each lost door key

A \$25 rescheduling fee will be charged for each reservation cancelled with fewer than four (4) days notice

The Solar Harvest Center's Community Commercial Kitchen was created to assist food entrepreneurs to start, grow and expand their businesses and for farmers and others to preserve and create local food products for local markets. The kitchen also provides an invaluable resource to Green Mountain College students interested in food production. The successful operation of this facility requires cooperation from all CCK users.

I acknowledge the receipt of the Solar Harvest Center Community Commercial Kitchen Policies and Procedures. I have read the terms of the Solar Harvest Center Community Commercial Kitchen Policies and Procedures and agree to abide by them.

Signed:

---

Signature

---

Printed Name

---

Business, Group or Event Name

---

Date

# Appendix Item F:

## Salvation Farms Relevant Blog Postings

<http://salvationfarms.wordpress.com/>

### Theory in Practice

Posted on December 22, 2012 by Salvation Farms



Black River Produce picks up potatoes cleaned, graded and packed by an inmate work crew at Southeast State Correctional Facility.

As Salvation Farms journeyed back out on our own last October, we had ideas about existing opportunities for creating smart solutions to managing farm fresh food waste while serving our communities' need to eat. I couldn't be more pleased with how we have been able to put our theories of untapped opportunities into practice this year. And what pleases me more is that collaboration with cross-sector partners has been obtainable.

Much of our energies went into sharing our mission and vision with stakeholders statewide, some of which immediately grabbed a hold of our ideals and assisted us in putting our theories into practice.



Garland Mason, New Agricultural Market Research Associate at Green Mountain College, with blanched green beans in the Solar Harvest House Commercial Kitchen.

It is significantly important that we acknowledge and highlight the working partnership we have been fortunate to enter into with [Green Mountain College](#) that began in May of this year and is in its final stages. This relationship, highlighted in an earlier post, consisted of:

1. guiding the [Rutland Area Farm & Food Link \(RAFFL\)](#) through an assessment and refinement of their Grow-a-Row/Gleaning program;
2. sourcing donated/gleaned crops from RAFFL that were in too great a volume to distribute to community sites raw;



Garland and University of Vermont volunteers process freshly gleaned corn into kernels to be frozen.

3. processing surplus donated/gleaned crops into different frozen product types, thus being the first stage of product development for our Vermont Commodities Program;
4. creating data tracking, inventory and distribution systems for this new product; and
5. engaging a handful of regional food shelves and meal sites in using these frozen food products and providing valuable feedback on the quality and ease of using the products.



Sam Dixon, Food Access and Gleaning Research Assistant at Green Mountain College (on right) delivers and discusses frozen product with Dana Pellistri at the Rutland County Parent Child Center.

We can't thank Green Mountain College enough for asking us to help fulfill an obligation to [Jane's Trust](#), a foundation that supported the college in exploring light processing of Vermont grown crops through using the Vermont Agency of Agriculture's Mobile Flash Freeze Unit. Working with the staff was such a treat, as was aiding them in the continued refinement of processes associated with integrating their new [Commercial Kitchen](#) into the college and community. Thank you Garland, Sam & Philip! You invested in Salvation Farms and in the future of the [Vermont Commodities Program](#), and continued your commitment to making Vermont a more food resilient state.



Sam deliveries to the Poultney based Young at Heart Senior Center.

The Rutland region sites that we were able to engage in product testing consisted of the [BROC Food Shelf](#), [The Open Door Mission](#), [Rutland County Parent/Child Center](#), [Boys & Girls Club](#), [Poultney Food Shelf](#) and [Young at Heart Senior Center](#). Out of 84 feedback forms distributed we received 37 complete with feedback. The perspectives these sites provided will guide us in creating future products, appropriate package sizes and labeling for an increased ease of integrating product use.



Apples being cored prior to making apple sauce in the Green Mountain College Community Kitchen.

We utilized eight different crop types, donated from twelve farms, totaling 1,471 raw pounds. When cleaned and prepped, the raw product available for processing weighed slightly more than 855 pounds; that is more than 2,565 servings of raw fruits and vegetables having a collective wholesale value of more than \$1,410.

One objective was to determine ideal processing procedures for a diversity of crops; if the same crop is prepared with different processes is one product preferred over another. We asked about ease of use, how the product was used and what price a site might be willing to pay for products if they were for sale. It was also important for us to determine if any of the products that were produced with higher efficiency and lower overhead were those that received more favorable ratings.



String beans being bagged after freezing.

Much of our feedback came from meal sites as this information was easier for the site workers to obtain versus trying to collect feedback from clients that access a food shelf and take the product home to prepare. Meal sites feeding children tended to be most enthusiastic about receiving, using and reporting on the product. They also tended to be more creative with the product too; they offered the most feedback on product utilization and suggested uses.

Our working partnership with Green Mountain College and RAFFL served as the perfect springboard for another Salvation Farms project we took coordinating leadership of in the northern reaches of Windham County at [Harlow Farm/Westminster Organics](#).



Several individuals representing [Harlow Farm](#), [Bellows Falls Our Place Drop-In Center](#), [Post Oil Solutions](#), [UVM Extension](#) and [USDA Rural Development](#) sat together one September afternoon to discuss how to retain regional farm surplus for winter use in serving the areas food insecure. It became quite clear to us that this was a perfect opportunity to get involved in further developing systems for processing surplus farm foods, engage volunteers in that process and continue testing our Vermont Commodities product.



Donated green bell peppers sliced and dice by volunteers ready to be frozen for use out of season.

This project allowed us the ability to test what knowledge we acquired while working with the talented folks at Green Mountain College while also working with increased volumes to see how scale affects efficiency and cost of producing Vermont Commodity products.

In total:

- 32 volunteers contributed 106 volunteer hours over the course of 5 weekends.
- Harlow Farm donated 4 crops (peppers, kale, apples & winter squash), that we processed and froze for winter use by the Bellows Falls Our Place Drop-In Center.
- More than 4,900 servings were processed.



Winter squash puree ready to be bagged for freezing.

We look forward to receiving feedback from these products as well as they are used throughout the winter in different prepared meals. The success of this project could not have been achieved without the generosity of Paul Harlow, the dedication of volunteers and the commitment of Bellows Falls Our Place staff, volunteers and board members!



Volunteers bag, weigh and label processed kale.



The weighing station on the potato pack line at the Southeast State Correctional Facility in Windsor Vermont.

As proud as we are of the work detailed above, we are equally as pleased with the work we achieved in partnership with the Vermont Department of Corrections' Offender Work Program, Tuberville, Black River Produce and the Vermont Foodbank; highlighted in our last blog post.

That project resulted in 31,290 pounds, more than 90,000 servings, of potatoes being funneled into the states charitable food system between Thanksgiving and Christmas. This was made possible by the labor provided by inmate work crews.

I'd like to leave you with a few quotes from inmates who helped us fulfill our vision for increasing Vermont's capacity to manage the food we have here before we feed our vulnerable citizens with food from afar.



Preparing product for shipping to the Vermont Foodbank for holiday distribution.

*"I think it's a great program and that it should continue." – David*

*“I liked it; glad I could help and would be proud to help again.” – Jesse*

*“It meant something positive that I contributed in.” – Matt*

For more photos of these projects, visit [our Facebook page](#), like us and let your network know that you support our vision for building smart farm surplus management systems in Vermont.

Please consider giving a gift to [Salvation Farms](#) this holiday season or become a perpetual donor by selecting monthly contributions through the [Donate Now](#) button on every page of this blog-site.

Thoughtfully & Thankfully –

*Theresa*

## More Progress through Partnerships

Posted on July 28, 2012 by Salvation Farms

The [Vermont Department of Corrections](#) (DOC), the [Community High School of Vermont](#) (CHSVT), and [Vermont Correctional Industries](#) (VCI) have agreed to work in partnership with Salvation Farms to develop and integrate the Vermont Commodities Program activities into correctional facilities educational programs and industrial productions. This partnership will utilize inmate labor thus providing individuals with career training, skill building, an industry certification, and a positive work experience while contributing to the Vermont community.



Southeast Correctional Facility & Work Camp Garden; Onion Production

We could not be happier about this project. It nicely compliments our research and development work occurring with [Green Mountain College](#) and it moves our Vermont Commodities Program one step closer to stability.

The volume of surplus generated by Vermont farms is great; we estimate that surplus fruit and vegetables exceed 2 million pounds annually. The Vermont Commodities Program will enable the state to retain a majority of its farm surplus through light processing. Lightly processed products will be made available to institutional kitchens serving the young, sick and elderly as well as to emergency food providers. As crop volumes and diversity will differ year to year, Salvation Farms is partnering with DOC/CHSVT/VCI to appropriately manage the inconsistency of product availability. This partnership enables us to create the necessary operational procedures to make the program cost effective and the end product affordable.



Southeast Correctional Facility & Work Camp Gardens

What a milestone it is for us to be closing in on the final details of a contract with these state partners.

Already we have begun working directly with the CHSVT horticulture program staff to gain an understanding of the vegetable production occurring this season within three correctional facilities and the systems in place to move food from field to meal. It will be one of our responsibilities to assist in making this process smooth, ensuring that all food produced is used within the facilities and that inmates are learning how to predict availability, harvest, wash, and pack product for a market (the dining hall).



Bob Chappelle With This Seasons Crop

We are also working on our first pilot to bring Vermont surplus farm product into a correctional facility for sorting, grading, and packing for easy inventory and distribution by the state's charitable emergency food organizations. This pilot consists of a partnership with the non-profit [Tuberville](#) and their for-profit partner [Chappelle's Vermont Potatoes](#).

As part of our contract we will ensure that educational and certification components are integrated into the program design. This component is a terrific opportunity to utilize an

[AmeriCorps VISTA](#) that we are co-hosting with [Laraway Farm/Laraway Youth & Family Services](#) starting later this year.

How exciting! Participating inmates will gain valuable skills in the food and farming industries while being given an opportunity to help themselves while simultaneously providing to others. This is an example of how Salvation Farms strives to creatively manage and utilize diverse resources.

Until next time –

Be well, eat well!

*Theresa*

## Progress through Partnerships

Posted on July 24, 2012 by [Salvation Farms](#)

We are very happy to share that at the end of May Salvation Farms signed a short-term



contract with [Green Mountain College's Farm and Food Project](#) to expand research on producing and integrating frozen Vermont produce into the state's food system, specifically the charitable food sector.

Throughout the summer and fall months, this partnership will develop a line of minimally-processed frozen local produce for use at food access points in the Rutland region that serve vulnerable populations; the young, elderly and hungry. This work will serve as a pilot for the Vermont Commodities Program which we aim to expand to serve emergency food organizations, nursing homes, schools and other institutional type kitchens in the future.



Mobile Flash Freeze Unit

The partnership makes use of the [Vermont Agency of Agriculture's](#) flash-freeze unit located at Green Mountain College and their new commercial kitchen. The contract is made possible by funding from Jane's Trust and produce processing will take place in the Solar Harvest Center Commercial Kitchen.



Solar Harvest Center

Surplus farm produce will be collected through the [Rutland Area Farm and Food Link](#) (RAFFL) [Grow-a-Row](#) program, a food access and gleaning program now in its fourth year. Grow-a-Row distributes fresh locally grown produce to meal sites and emergency food shelves weekly during the growing season. Salvation Farms is working directly with the Grow-a-Row coordinators to refine the program's operational systems in hopes of increasing their efficiency and ability to rescue more surplus farm produce from the region's farmers. This is in line with our history as one of the oldest organizers and advocates for gleaning in Vermont.



Garland Mason & Sam Dixon; Grow-a-Row Collection at Rutland's Farmers Market

What a wonderful arrangement for Salvation Farms. We are getting the opportunity to test our role as the technical adviser and consultant through the Vermont Gleaning Collective as we actively explore the development of the Vermont Commodities Product line.

There couldn't be a better arrangement in our first year of developing new programs; both of these partners are longtime friends and supporters of the Salvation Farms' vision. We are so very grateful to Green Mountain College for opening the door to engage and partner with us as we build our foundation.

We look forward to sharing more from these partnerships as we proceed through the season.

Until then – be well, eat well!

*Theresa*